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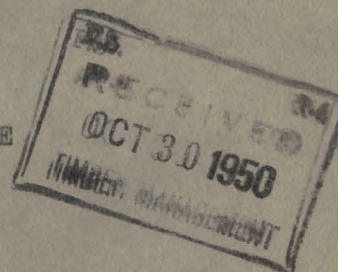
TITLE

INSECT SURVEY

MOUNTAIN PINEBEETLE IN LODGEPOLE PINE

TARGHEE-TETON PROJECT

1950



Forest Insect Laboratory
Coeur d'Alene, Idaho

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INSECT SURVEY

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TARGHEE-TETON PROJECT

1950

The Targhee-Teton project was initiated in the fall of 1946 when the U. S. Forest Service made a survey of the lodgepole pine stands to determine the extent of a mountain pine beetle outbreak. The project area is approximately 500,000 acres in extent and includes parts of the Caribou, Bridger, Targhee and Teton National Forests; Grand Teton National Park, Jackson Hole National Monument and small areas of privately owned and State owned timber lands. The insect infestation is considered as a single outbreak.

With the exception of the initial survey, annual surveys of the infested stands have been made under the supervision of this laboratory. The trend of the infestation and a brief outline of control operations have been presented in previous reports and is again repeated, with the addition of 1950 data, to give a better understanding of the data in the following tables.

1946: Surveys were made on many of the infested areas late in the fall. Data from these surveys supplemented by visual estimates gave a total estimate of 213,000 infested trees on all areas. Most of these infested trees were on the Caribou Forest.

1947: Spring control work was undertaken against only that portion of the infestation found on the Targhee and Teton Forests and Teton National Park. Complete control was not accomplished on the areas undertaken, but 43,000 trees were treated. The treatment of these trees during what is believed to have been a very critical period of this infestation undoubtedly served to hold the infestation in check and helped set the stage for what was to happen the following year. During the fall of 1947 a survey was again made on the Targhee and Teton Forests, parts of the Bridger and Caribou Forests and the Teton Park and Jackson Hole Monument. The data was more complete except for the back areas of the Caribou Forest. An estimate of 105,000 trees was made which included a guess of 5,000 trees along the Snake River face of the Caribou. During late fall about 6,000 trees were treated on the Teton Forest and in Teton Park.

1948: A spring control project was organized on a scale designed to clean up the infestation on all but the Caribou Forest. During the project, including the 1947 fall work, 114,000 infested trees were treated.

(Prior to the spring of 1948 all trees treated were felled and sprayed on the ground. During the 1948 spring project and all subsequent control was by spraying the trees standing.) The control measures were successful in reducing the infestation by 75 percent.

During the late summer and fall of 1948 a survey was made of all areas including the infested portion of the Caribou. It was found that the infestation on the control areas had been reduced to 28,000 trees. Most of these were on the Targhee forest adjacent to the Caribou. The total infestation including the Caribou Forest was estimated at 67,000 trees. The first signs of decline were noted on the Caribou forest in the Caribou Basin where approximately 90 percent of the stand had been killed on several thousand acres. The infestation in this area often thought to be the source of the entire outbreak had run its course.

New areas of virulent infestation were found in northern areas of the Teton Forest and Teton Park. An older infestation in the northern part of the Targhee Forest thought to be a local buildup was also included in the survey area.

1949: Control plans were designed to clean up all areas in what was hoped to be a final effort to control the outbreak and leave little more than spot or maintenance control to follow. However, circumstances did not permit this project to start until it was too late to complete the work. Control on a reduced scale was undertaken on three areas on the Targhee, four areas on the Teton, part of the Caribou and part of Teton Park. Altogether 17,918 trees were treated. During the fall of 1949 all areas were again surveyed. The number of trees infested in 1949 was estimated as 50,660 - a decrease of 24 percent.

Control measures during the fall of 1949 and spring of 1950 treated 40,106 infested trees on 217,585 acres. All areas recommended for treatment were cleaned up except small areas in Grand Teton National Park.

The following table will summarize the acreage covered and trees treated by forest areas during the fall of 1949 and spring of 1950 control projects.

FOREST AREA	ESTIMATED ACREAGE TREATED	TREES TREATED
Caribou Forest	16,565	4,882
Targhee Forest	130,537	18,560
Teton Forest	34,300	7,021
Bridger Forest	600	600 est.
Teton Park & Monument	40,381	10,684
	<u>222,383</u>	<u>41,727</u>

217,585
47,986

1,721 trees

The survey just completed shows the 1950 infestation to be estimated at 12,248 infested trees on 455,639 acres, a reduction of 76 percent. Approximately one fourth of the current infestation is in the Grand Teton National Park and Jackson Hole Monument.

All but six of the National Forest units have decrease in numbers of infested trees to the point where control is no longer considered necessary.

The following tables will show the estimates of infested trees as recorded on the 1950 survey. Some of these units have been revised from time to time as better acreage data were obtained.

The percent of survey coverage applied varied on different units depending upon the past history of the infestation. Where the infestation has remained light during the past two years, only a reconnaissance of 1 to 1 1/2 percent was used. Many of the unit areas are now considered to be infested to a normal degree. The remarks in the following table refer largely to past treatment. Unit numbers will give the location of the unit on the maps in the back of the report.

INSECT SURVEY, CARIBOU FOREST
1950

UNIT	NO.	APPROX. 1950 ACRES TYPE	1950 ATTACKS PER ACRE	1950 INFESTATION	% CHANGE FROM 1949	ACTION RECOMM'D	% SURVEY	REMARKS
North Caribou Basin	1	9800	0	Normal	0			Reconnaissance only.
South caribou Basin	2	6400	0	0	-100		1.5	Spring control.
McCoy Creek	3	5800	.07	406	- 90	Control on part_of unit.	2.5	Spring control.
Bitters Peak	4	2000	.10	200	- 28	Control on part_of unit.	3.7	Spring control.
Trout Creek	5	2000	.07	140	0		2.5	
Jackknife Creek	6	2700	.03	81	- 70		1.2	
Diamond Flats	7	4000	.01	40	0		1.0	
Snake River	10	3000	0	0	0		1.0	
		<u>35700</u>		<u>867</u>				

INSECT SURVEY, TARGHEE FOREST
1950

UNIT	NO.	APPROX. 1950 ACRES TYPE	ATTACKS PER ACRE	1950 INFESTATION	% CHANGE FROM 1949	ACTION RECOMM'D	% SURVEY	REMARKS
Alpine	14	4400	.02	88	- 75		3.0	Spring Control.
Hawley Gulch	16	10500	.02	210	- 91		4.5	Spring Control.
Hinkley	17	5550	.01	55	- 94		4.0	Spring control.
Muddy Springs	18	7680	.03	230	- 63		4.3	Spring control.
Canyon Creek	19	5500	.01	55	- 97		4.0	Spring control, acreage increased from 5064 to 5500.
Kirkham Hollow	20	1096	0	0	-100		5.4	Spring control.
Horseshoe-Packsaddle	22	9769	.10	1008	- 6	Control on 1120 A. & 1008 Trees.	2.0	5% Sur. on 1120 Acres.
Mahogany & Twin Creeks	23-24	6370	.01	64	- 87		2.7	Spring control.
Henderson & Drake	25	3100	.01	31	- 97		3.7	Spring control.
Upper Trail Creek	26	864	.02	16	- 87		5.0	Spring control.
Lower Trail Creek	27	1800	.05	90	- 29		3.0	Spring control.
Moose Game & Sweet	28	1150	.03	35	- 57		8.0	Spring control.
Little Pine to Nordel	29	5000	.01	62	- 90		4.8	Spring control.
Rainey Creek	30	2200	0	0	-100		4.0	Spring control.
North Pine Creek	31	5900	.14	826	- 76	Control on 1440 Acres for 677 trees.	3.8	Fall '49 control.
West Pine Creek	32	2000	.01	20	- 97		6.3	Spring control.
Lower Pine Creek	33	800	0	0	-100		3.6	Some spring control.
Mike Spencer	34	1800	0	0	-100		2.3	Spring control.
Tie Canyon	35	2800	.02	56	- 97		4.3	Spring control.
Dog Creek	36	2000	0	0	-100			Reconnaissance only.
Cabin Creek	37	1800	0	0	0			Reconnaissance only.
Elk Creek	38	3000	.01	30	- 94		4.6	Spring control by Teton National Forest.

INSECT SURVEY, TARGHEE FOREST, 1950
CONTINUED

UNIT	NO.	APPROX. 1950 ACRES TYPE	ATTACKS PER ACRE	1950 INFESTATION	% CHANGE FROM 1949	ACTION RECOMM'D	% SURVEY	REMARKS
Squirrel Creek	39	18000	.04	900	- 67	Control recommended on North 1/2 for 900 trees on 9000 Acres.	2.7	Hotspot <u>Spring</u> control.
Porcupine	40	13000	.02	260	- 80		2.5	Hotspot <u>spring</u> control.
Falls River	41	14000	.02	280	- 71		1.0	Reconnaissance only.
Spring Creek	42	600	.05	30	- 83		6.0	Spring control.
Green Canyon	43	5000	.03	150	- 73		5.0	Spring control.
Bear Canyon	44	3600	.05	180	+ 25		2.0	Spot control.
Thurburn Ridge	45	1200	0	0	-100		5.6	Spot control.
Bishop Mt. - Antelope Flats	46	5000	.11	550	- 35	2100 Acres recommended for control in 2 spots having .26 per acre.	5.0	Partial <u>control</u> .
Hotel Creek	47	10800	.11	1188	+ 37	Control recommended.	4.3	Spring control.
Yale - Stamp Meadows	48	10000	0	0	-100		3.0	Reconnaissance 3/42 acres road strip.
Buffalo - Big Springs	49	20000	0	0	0		1.5	A total of 141 miles
Island park - Split Creek	50	36000	0	0	0		.5	of 1 1/2 chain road-
Big Bond	51	35000	.01	0	- 50		1.0	side samples taken on
Osborne - Lower Falls	52	4000	0	0	0		1.0	units 49, 50, 51, & 52.
		297,279*		6414				

* Of this acreage, 155,000 Reconnaissance, 142,279 Surveyed.

INSECT SURVEY, TETON FOREST 1950

UNIT	NO.	APPROX. 1950 ACRES TYPE	ATTACKS PER ACRE	1950 INFESTATION	% CHANGE FROM 1949	ACTION RECOMM'D	% SURVEY	REMARKS
Wilson North	53	2300	0	0	-100		3.0	
Wilson South	54	4570	.02	91	- 90		3.2	Spring control on Crescent H. Area.
Mosquito Creek	55	5300	.04	212	- 80		4.6	Spring control on about 3 Sections.
Taylor Mt.	56	3860	.02	77	- 75		4.1	
Fall Creek	57	7680	.02	154	- 60		3.0	
Coburn Creek	58	2000	0	0	-100		4.3	
Bailey Creek	59	700	.03	21	- 70		4.3	
Game Cr. & Wilson Can.	64	2500	0	0	-100		2.4	Spring control on part.
Cache Creek	65	1020	.02	20	- 67		4.2	
Sheep Creek	66	1000	.02	20	- 94		5.5	Spring control.
Ditch & Turpin Creeks	67	7000	.04	280	- 78		5.0	
Lost Creek	68	3080	.11	339	- 58	Control Rec. on 2400 acres	5.1	Fall '49 control.
Upper Ditch Creek	69	6200	.04	248	- 89		4.9	Spring control on 3200 acres.
Horse Trail Creek	70	1700	.03	51	- 63		3.9	Spring control.
Lower Gros Ventre	71-72	1900	.07	133	- 75		3.0	Spring control on part of section.
State Creek & Upper Gros Ventre	73	12500	0	0	0			Reconnaissance strips in State Creek.
Spread Creek	74	5300	.03	159	- 57		4.1	Fall & Spring control.
Lava Creek	75	1400	.02	28	- 91		5.3	Spring control.
Pacific	76	2500	0	0	0		4.0	Reconnaissance on 2500 A.
Upper Buffalo River	77	4140	0	0	-100		3.4	Includes 1 strip on Uhl Hill.
Glade Creek	78	2560	0	0	0			Reconnaissance along road 23 miles.
		<u>79210</u>		<u>1833</u>				

INSECT SURVEY, BRIDGER FOREST
1950

UNIT	NO.	APPROX. 1950 ACRES TYPE	1950 ATTACKS PER ACRE	1950 INFESTATION	% CHANGE FROM 1949	ACTION RECOMM'D	% SURVEY	REMARKS
Greys river	12	6400	.02	128	- 50		1.0	
Salt River Junction	13	600	.03	18	- 40			Reconnaissance.
Pinedale Townsite	—	100	0	0	-100			Spring control.
Pole Creek	—	150	0	0	-100			Spring control.
		<u>7250</u>		<u>146</u>				

INSECT SURVEY
GRAND TETON NATIONAL PARK AND JACKSON HOLE NATIONAL MONUMENT
1950

UNIT	NO.	APPROX. 1950 ACRES TYPE	ATTACKS PER ACRE	1950 INFESTATION	% CHANGE FROM 1949	ACTION RECOMM'D	% SURVEY	REMARKS
Signal Mt.	1-1A	4100	.15	615	- 60	Control Re- commended.	3.4	Spring control.
Burnt Ridge	2	1800	0	0	-100		3.5	Spring control.
Jenny Lake	3	700	.04	28	- 66		3.6	Spring control.
Headquarters	4	2500	.05	125	- 90		4.5	Spring control Not completed.
Windy Point	5	3000	.16	480	- 64	Control rec.	4.7	Spring control.
J. Y. Ranch	6	4150	.15	622	0	Control rec. on 600 Acres.	4.5	Spring control Not completed.
Timbered Island	7	600	.12	72	0	Control recommended.	4.0	Spring control.
Black Tail Butte	8	250	.31	77	- 78	Control recommended.	7.6	Spring control.
Jackson Lake	9A	2000	.14	280	- 87	Control rec.	4.2	Spring control.
Jackson Lake	9	6000	.05	300	- 69		4.4	Spring control.
Snake River	10	300	.07	21	- 92		9.3	Fall control by P.S.
Hermitage Point	11-12	9200	.04	368	- 60		1.8	Spring control.
Lava Creek	13	1600	0	0	-100		4.1	Spring control by P.S.
		36200		2988				

From the foregoing tables it is apparent that the decrease in the infestation in 1950 is very noticeable. Recommendations for further control have been made in some areas. A summary of these areas are given in the following table.

FOREST AREA	ACRES	INFESTED TREES
Caribou Forest	600	400
Targhee Forest	24,460	4319
Teton Forest	2,400	336
Grand Teton Park	10,550	2146
	<u>38,010</u>	<u>7201</u>

A more complete analysis of the infestation is given in the following remarks where further explanation is felt to be necessary.

CARIBOU NATIONAL FOREST

No sample strip was run in the North Caribou Basin unit where the infestation has declined since 1948. Two mandays were spent in the area searching for attacked trees, however, only a few light, one-sided attacks were found. These were on previously attacked trees. Because nearly all the mature trees have been killed in this unit it can no longer be considered host type.

The South Caribou Basin unit warranted a higher percentage of survey than was obtained due to an error of plotting. However, the unit was also scouted. No infested trees were found even in the areas of serious 1949 infestation. Control measures were very effective in this unit.

Spring control measures were applied to all the lodgepole pine stands on the south side of McCoy Creek from the Snake River to the head of South Caribou Basin. This included all of units 2, 3, and 4. The control project covered 2365 acres more than the estimated acreage and treated 4882 trees - 700 less than estimated. The work was very effective except for a small area of about 400 acres in the Bitters Creek drainage in Section 12T. 3S., R.45E. and Section 7T. 3S., R.46E. and a small area east of the McCoy Creek Guard Station in Section 17. Control measures have been recommended for these areas and detailed maps have been furnished to the Caribou Forest.

The Trout Creek unit showed no change during 1950. It seems to be infested to what might be termed a high endemic level. Only reconnaissance strips were run in the Jackknife, Diamond Flats and Snake River units. The small areas in Sheep, Olson and Kendal Canyon were not surveyed because they were found to be uninfested in 1949, and because of the difficulty of reaching them. While no sample strip was run in the Bear Creek drainage, the type was well scouted by two men. No infestation whatever was found in areas previously found to be heavily infested.

TARGHEE NATIONAL FOREST

Insect control measures were applied to nearly all the Targhee units during the spring of 1950. Units not controlled were the Dog Creek and Cabin Creek drainages where the control measures of 1948 seems to have been particularly effective and the last five units listed which are not control units. These last five units are large areas of lodgepole pine that have as yet remained practically free from infestation. Because these bodies of timber are adjacent to infested areas they have been closely watched and surveyed by extensive reconnaissance methods during the past two years.

The control measures as applied to the Targhee infested areas varied from complete coverage of the entire unit to partial coverage and in some instances to spot control by scouting and treating.

Comparative survey data show that the infestation on the Targhee Forest decreased 74 percent during the past season. Only two areas increased. Of these two, the Bear Canyon infestation is so light that it is not significant. The actual increase shown by the data is from .04 per acre to .05. The reason for the increase in the Hotel Creek unit is a difficult question to answer. During the spring control project, the entire unit was treated and 3200 acres were covered in addition. The 3200 acres included areas further west where the type is patchy and indefinite.

Control measures are recommended for the Hotel Creek unit on a somewhat revised acreage and for parts of four other units as follows:

UNIT	ACRES ON WHICH CONTROL IS REC.	ESTIMATED INFESTED TREES
Horseshoe Pack Saddle	1120	1008
North Pine	1440	677
Squirrel Creek	9000	900
Bishop Mt. - Antelope Flats	2100	546
Hotel Creek	<u>10800</u>	<u>1188</u>
	24,460	4,319

TETON NATIONAL FOREST

The 1950 infestation of the Teton Forest units showed an overall decrease of 76 percent. All of the Teton Forest units are now at a near endemic level. A portion of the Lost Creek unit was found to be re-infested to the extent of .14 per acre. Control measures are now being undertaken to treat an estimated 336 trees on 2400 acres of this unit.

BRIDGER NATIONAL FOREST

Insect control measures were undertaken on two small areas by the Bridger Forest. Both areas were largely outside the national forest. The town-site of Pinedale, Wyoming contains about 100 acres of lodgepole pine that was found to be heavily infested in 1949.

Approximately 300 infested trees were treated in the residential section during the winter under the direction of the forest service. The second infested area was a long narrow stringer of timber along Pole Creek which extended about seven miles out into the arid flats. Beaver dams had caused a high degree of water damage to the trees along the stream and no doubt was a factor contributing to the infestation of approximately 200 trees in 1949. These trees were treated last spring. An examination by 100 percent scouting of the trees in Pinedale during the survey located but three 1950 attacked trees. These infested trees were unsuccessful, pitched out attacks. No 1950 infestation was found in the Pole Creek strip.

GRAND TETON NATIONAL PARK AND JACKSON HOLE NATIONAL MONUMENT

Control measures undertaken during the fall and spring were completed on all but a few small areas, an estimated 600 acres. The subsequent reduction in the 1950 infestation was 73 percent. While all the park and monument units showed reductions in the number of infested trees, many of the areas are reinfested to a serious degree. Control measures are recommended for the following six units.

UNIT		ACRES ON WHICH CONTROL IS REC.	ESTIMATED INFESTED TREES
Signal Mt.	1-1A	4100	615
Windy Pt.	5	3000	480
J. Y. Ranch	6	600	622
Timbered Island	7	600	72
Blacktail Butte	8	250	77
Jackson Lake	9A	2000	280
		<u>10,550</u>	<u>2,146</u>

In addition to the units listed, 169 acres of survey strips were run in the monument between Arizona Creek to the South entrance of Yellowstone Park. In the vicinity of Two Ocean and Emma Matilda Lakes, 39 acres of sample strips were run and 36 acres in twelve short check strips were also run between the South entrance and West Thumb in Yellowstone Park. No infestation was recorded in these areas.

The following table will give a breakdown of mandays and cost.

	Man Days
Training	54
Camp Construction, operation and moving	122
Supervision	107
Checking other than by Supervision	19
Sample strip	457
Annual leave	35
Paid Holidays	4
	<u>798</u>

Miles of Transportation	Miles
Forest Service Rental 2 Power Wagons	1964
Forest Service Rental 2 Jeeps	3437
Park Service Contribution 3 Jeeps	5950
Forest Insect Laboratory 1 Pickup	7118
	<u>18,469</u>

Cost

Salaries	Subsistance	Transportation	Total
\$10,621.74	\$1,808.63	\$1,359.95	\$13,790.32

Shortly after the 1949 survey of the Targhee-Teton project area had been completed a serious error in the estimated number of infested trees was discovered through control operations. The error was found to have been caused by late emerging insects and reemerging parent adult insects making attacks subsequent to the survey of the area. The error from this cause was later found to be confined to the one unit. At that time, however, the effect of the late dry summer, which seems to have caused the peculiar attack behavior, was not fully known. To offset the possibility of this condition being widespread over all the project area a safety margin of 30 percent was added to all the unit estimates. It was later found that this fear was unfounded; the overrun was confined to the Lost Creek unit where the first survey strips of the season were run. Obviously the survey was started too early. However, because of the size of the project area and the limited time available to make the survey and also because of a shortage of qualified survey personnel, it was necessary to start this survey at the earliest possible date. Ordinarily, a tabulation of recent attacked trees is kept as the survey work progresses. If the relationship of those recent attacks to the older attacks persist to any significant extent through the early weeks of the survey, an adjustment is made on a percentage basis to the estimates of the first units surveyed. During the 1949 survey this procedure did not provide the needed correction because the survey crews had moved into very lightly infested timber where no corrective data were obtained. To offset such a possible error in the 1950 survey, a number of the early strips were rerun at the end of the job, and a change in order of units surveyed was made. Units on the Caribou and lower areas were surveyed first and those in the more retarded, higher areas surveyed last wherever possible. Altogether, 14 sample strips were rerun. These strips, while it was not possible to follow exactly the original, did not show a significant change from the first sample, the data were nearly identical. From this check it is felt that the data presented are free from error caused by what might be termed a biological trait.

The survey started August 2 with the construction of a training camp. Training ended August 10 and the actual sampling started August 11. All work was completed by September 30.

During this period 10,652 acres of sample strip were run in the project area and 1743 acres of roadside sample was examined on reconnaissance.

